A newly isolated probiotic Enterococcus faecalis strain from vagina microbiota enhances apoptosis of human cancer cells

ABSTRACT

Aims: This study aimed to describe probiotic properties and bio-therapeutic effects of newly isolated Enterococcus faecalis from the human vaginal tract. Methods and Results: The Enterococcus faecalis strain was originally isolated from the vaginal microbiota of Iranian women and was molecularly identified using 16SrDNA gene sequencing. Some biochemical methodologies were preliminarily used to characterize the probiotic potential of Ent. faecalis, including antibiotic susceptibility, antimicrobial activity, as well as acid and bile resistance. The bio-therapeutic effects of this strain's secreted metabolites on four human cancer cell lines (AGS, HeLa, MCF-7 and HT-29) and one normal cell line (HUVEC) were evaluated by cytotoxicity assay and apoptosis scrutiny. The characterization results demonstrated into the isolated bacteria strain revealed probiotic properties, such as antibiotic susceptibility, antimicrobial activity and resistance under conditions similar to those in the gastrointestinal tract. Results of bio-therapeutic efficacy assessments illustrated acceptable apoptotic effects on four human cancer cell lines and negligible side effects on assayed normal cell line. Our findings revealed that the apoptotic effect of secreted metabolites mainly depended on proteins secreted by Ent. faecalis on different cancer cells. These proteins can induce the apoptosis of cancer cells. Conclusion: The metabolites produced by this vaginal Ent. faecalis strain can be used as alternative pharmaceutical compounds with promising therapeutic indices because they are not cytotoxic to normal mammalian cells. Accordingly, the physicochemical, structural and functional properties of the secreted anticancer substances should be further investigated before using them as anticancer therapeutics. Significance and Impact of the Study: This study aim to screen total bacterial secreted metabolites as a wealthy source to find the new active compounds to introduce as anticancer therapeutics in the future.

Keyword: Antibiotic susceptibility; Anti-microbe; Apoptosis; Cytotoxicity